PATENT SPECIFICATION

Application Date: Dec. 17, 1926. No. 31,940/26. **267,607**

Complete Accepted: March 17, 1927.

COMPLETE SPECIFICATION.

Improvements in or relating to Rotary Power Plants.

I, GUSTAV BAUER, of 82, Mittelweg, Hamburg, Germany, a citizen of the German Republic, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the regulation of installations for electric light or power stations, pumping stations or the like, in which two or more engines (for instance oil engines) drive one or more generators, pumps, compressors or the like which are liable to considerable load fluctuations by means of hydraulic couplings and mechanical reducing or multiplying gearing.

In such installations it is common practice, in order to ensure economical working if there be two engines to employ only one when the load amounts to one half or less, and only after the load has exceeded one half is the second engine thrown in; similarly, in installations with three engines, one engine is used up to one third of the load, two engines up to two thirds of the load and the third engine will be thrown in only above two thirds of full load. The regulation in such engine installations implies, however, a very specially skilled and reliable stiff, andoccupies thewhole of their attention, and it is the object of the present invention to simplify this regulation and render it independent of the human factor, thus enabling the installation to be worked with the most economical number of engines. With a view of eliminating manual operation a proposal has been made to provide motors supplementary to a main motor and connected therewith or with the driven shaft by clutches automatically operated on the attainment of certain predetermined loads on the driven shaft.

According to this invention the regulation of the engines is effected by means of a governor mounted on the driven shaft (for instance on the generator shaft), this governor operating first to place full load on one engine by causing the hydraulic coupling through which its torque is transmitted to be filled and then, by similar means, to bring other engines consecutively into action when the first engine is fully loaded and the load is still increasing, and further, to disconnect them again when the load decreases. The connection and disconnection of the single engines and the distribution of the load between them can be arranged to take place in a sequence and to an extent determined beforehand and is effected by filling and emptying the couplings.

In addition to the driving engines, which may be oil engines, driving the generator or other shaft through gearing, steam turbines or engines could also be provided supplied for instance with steam from a separate steam generator utilising heat of waste gases. According to the load, one or the other set of engines could be used, and the remaining one could form a standby. In the case of peak loads, however, both sets of engines could be used jointly for driving the generator or other shaft. In this case also the regulation is effected by a governor mounted on the generator shaft.

Two arrangements according to the invention are illustrated by way of example in the accompanying drawing.

In the arrangement shown in Figure 1 the prime movers are oil engines, the engine 1 driving through the shaft 3, hydraulic coupling 11 and gear wheel 5, and the oil engine 2 through the shaft 4, hydraulic coupling 12, and gear wheel 6, a common gear wheel 7 mounted on the driven shaft 8 of the generator or other apparatus 9. By means of the governor 10 driven from the generator shaft and operating through any ordinary type of mechanism, at first only one

[*Price* 1/-]

engine, for instance 1, is connected by filling the coupling 11 and only when the load on the generator exceeds the full load of this engine is engine 2 similarly thrown into action and subsequently thrown out again when the load decreases. Alternatively, first the engine 2, and afterwards engine 1, could be brought into action.

In the arrangement shown in Figure 2, in addition to the oil engines 1 and 2, a steam turbine or engine 13 is further provided for driving the generator, the turbine 13 being switched in or out by means of the coupling 14, which might also be a hydraulic coupling. The regulation, that is the connection or disconnection by filling or emptying the appropriate coupling of the engine 1 or 2 or of the steam turbine 13, is effected by the governor 10 of the generator 9, so that in the case of peak load, all the prime movers will jointly drive the generator 9, but in the case of a smaller load, only one or another of them. The arrangement could, however, be carried out in such a manner that the normal driving of the generator 9 would be effected by the steam turbine 13, and the oil engines 1 and 2 would form a stand-by, in order to have a sufficiently powerful installation also in the case of failure of the turbine 13. Provision might also be made so that the work would be done with a single generator driven at will either by the steam turbine 13 or by the oil engines 1, 2.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A power plant employing two or more prime movers transmitting power through hydraulic couplings and mechanical gearing to a single driven shaft in which a governor associated with the driven shaft operates to bring the prime movers into action successively with increase of load on the driven shaft when the said load exceeds that for which the prime mover or movers already in action is or are designed by successively filling the appropriate hydraulic couplings and to withdraw the prime movers successively from action with decrease of load on the driven shaft by a corresponding emptying of the hydraulic couplings.

2. A power plant as in Claim 1, in which one or more internal-combustion engines is or are associated with one or more steam turbines or engines, preferably supplied with steam generated from the heat of waste gases.

3. A power plant substantially as hereinbefore described with reference to either of the figures on the accompanying drawing.

Dated this 17th day of December, 1925.

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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1927.

Fig. 1.

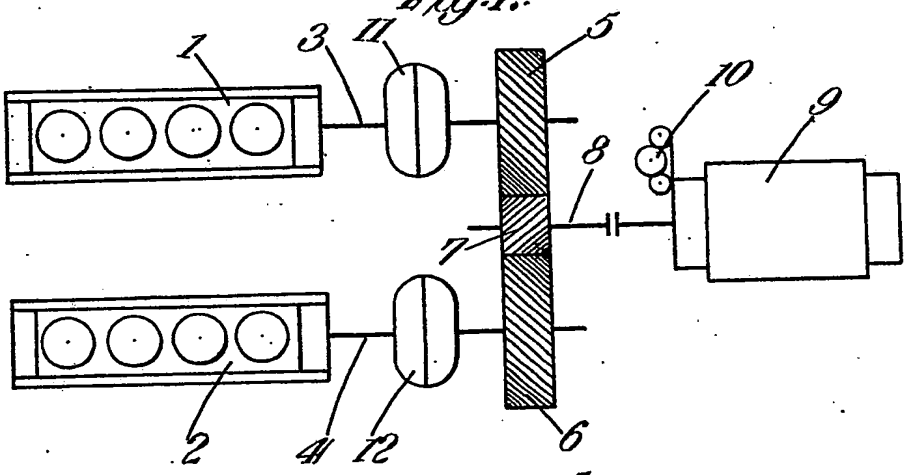
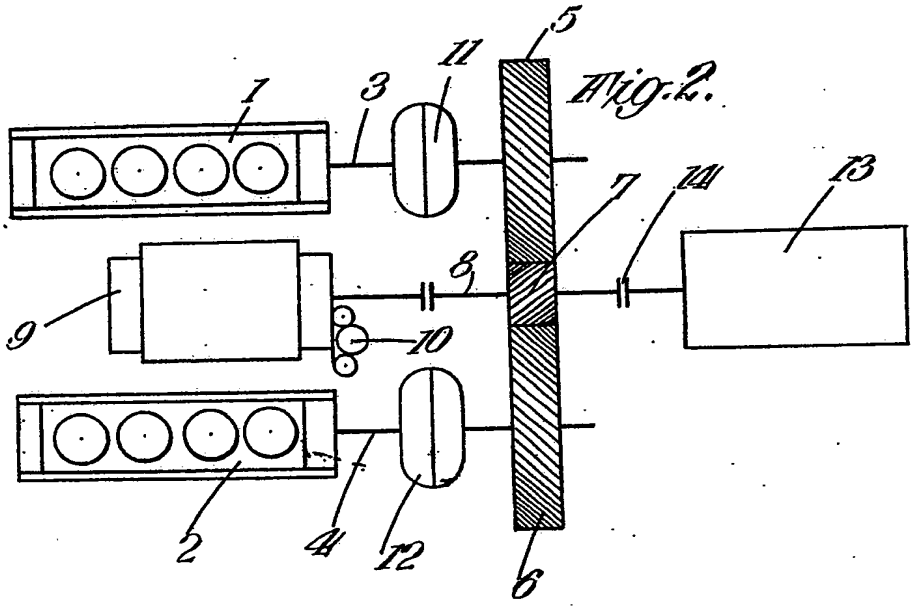


Fig. 2.



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